APPENDIX A

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

No. 96-1192

THE MARYLAND CASUALTY COMPANY,
as Subrogee of Eileen K. Gitelson;
EILEEN K. GITELSON;
SELMA INVESTMENT CORPORATION,
Plaintiffs-Appellees,

v.

THERM-O-DISC, INCORPORATED,
Defendant-Appellant,

and

WHIRLPOOL CORPORATION;
EMERSON ELECTRIC COMPANY,
Defendants.

Appeal from the United States District Court
for the District of Maryland, at Baltimore
J. Frederick Motz, Chief District Judge
(CA-93-1132-JFM)

Argued: May 8, 1997
Decided: February 27, 1998

Before WILKINSON, Chief Judge, and RUSSELL *
and MICHAEL, Circuit Judges

Affirmed by published per curiam opinion.

COUNSEL

ARGUED: John M. Kobayashi, KOBAYASHI & ASSOCIATES, P.C., Denver, Colorado, for Appellant. Mark E. Opalisky, COZEN & O'CONNOR, Philadelphia, Pennsylvania, for Appellees.

OPINION

PER CURIAM: [1]

This appeal requires us to consider the sufficiency of an evidentiary determination made by the district court. Specifically, we are called upon to decide whether the district court properly carried out its function as evidentiary "gatekeeper" pursuant to the Supreme Court's mandate in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[2] Because we find that the district court made its decision to admit certain expert testimony in accordance with the demands of *Daubert* and its progeny, we affirm its ruling.

Facts and Procedural Background

The underlying facts of this case are straightforward. On the evening of December 30, 1991, fire broke out in Eileen Gitelson's home in Potomac, Maryland. Mrs. Gitel-

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* Judge Russell participated in the decision of this case, but died prior to the time the opinion was issued. The opinion is filed by a quorum of the panel pursuant to 28 U.S.C. § 46(d).

[1] This opinion was drafted by Judge Donald S. Russell. Judge Russell died while the case was under submission. The remaining panel members continue to concur in the opinion prepared by Judge Russell.

[2] 509 U.S. 579 (1993).

son's insurance carrier, Maryland Casualty Company ("Maryland Casualty"), paid Mrs. Gitelson for her loss, and was subrogated to any claims she had regarding the fire. Maryland Casualty then sued Appellant Therm-O-Disc, Inc. ("Thermo-O-Disc") to recover for the damage, alleging that a defective thermostat, manufactured by Thermo-O-Disc and contained in Mrs. Gitelson's Whirlpool drier, caused the fire.

At trial, Maryland Casualty sought to introduce the testimony of James Rodems ("Rodems"), an electrical engineer specializing in thermostats and other electrical switches. Rodems was expected to testify that, in his opinion, the fire that began in Mrs. Gitelson's drier was indeed caused by a malfunction in the Therm-O-Disc thermostat. Therm-O-Disc objected to this proferred testimony, and moved *in limine* to exclude it. As a result of this objection, the district court held a "*Daubert*-type hearing" [3] to determine whether Rodems's testimony was admissible.

This *Daubert* hearing lasted several hours, and resulted in the district court's admission of Rodems's testimony. At the close of all evidence in the case, Therm-O-Disc made a motion for judgement as a matter of law pursuant to Rule 50(a) of the Federal Rules of Civil Procedure, arguing that: (A) Rodems's testimony was based on conjecture and speculation and was therefore not properly admitted, and (B) Maryland Casualty had failed to show a causal link between the allegedly defective thermostat and the fire. The district court denied this motion.

The jury returned a verdict in favor of Maryland Casualty, and assessed damages in the amount of $635,893 against Therm-O-Disc. Therm-O-Disc renewed its motion for judgement as a matter of law, which the district court also denied. This appeal followed.

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[3] J.A. at 2.

Discussion

I.

Therm-O-Disc's primary argument in this appeal is that the district court failed to apply the test for the admission of expert scientific testimony demanded by *Daubert*. Within this broad allegation, Therm-O-Disc makes several specific arguments. We consider each in turn, and review the district court's decision to admit the testimony for abuse of discretion.[4]

A.

Therm-O-Disc first argues that the district court erred in placing on Therm-O-Disc the "burden of proof" [5] regarding the relevance and reliability of Rodems's testimony. Such a shift constitutes error, Therm-O-Disc contends, because "*Daubert* requires the party proffering the expert testimony to meet its Rule 104(a) [of the Federal Rules of Evidence] burden by a preponderance of evidence." [6] *Daubert*, however, makes no mention of a burden of "proof" regarding the decision to admit expert scientific testimony. We assume Therm-O-Disc misuses this term to denote Maryland Casualty's burden of *production*—that is, the burden of coming forward with evidence from which the trial court could determine, as *Daubert* demands, that (1) the expert will testify to "scientific knowledge," and (2) the expert's testimony "will assist the trier of fact to understand or determine a fact in issue." [7]

Nevertheless, in treating this as a "burden of proof," Therm-O-Disc misreads *Daubert*. All *Daubert* demands is that the trial judge make a "preliminary assessment" of whether the proffered testimony is both reliable (i.e. based

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[4] *General Elec. Co. v. Joiner*, 118 S. Ct. 512, 517 (1997).

[5] Appellant's Br. at 18.

[6] *Id.* at 20.

[7] *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 592 (1993).

on "scientific knowledge") and helpful (i.e. of assistance to the trier of fact in understanding or determining a fact in issue).[8] As in all questions of admissibility, the proferring party must come forward with evidence from which the court can determine that the proffered testimony is properly admissible. However, there is no requirement in *Daubert*, or any other controlling authority, that the proffering party must "prove" anything to the court before the testimony in question can be admitted.[9]

In replacing the stricter "general acceptance" test of *Frye v. United States*[10] with its requirement that the proferred testimony merely be reliable and helpful, the *Daubert* court expressly stated that it did so in keeping with the " 'liberal thrust' "[11] of the Federal Rules of Evi-

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[8] *Id.*

[9] *Daubert* cites Rule 104(a) of the Federal Rules of Evidence ("Rule 104(a)"), which states, in part, that "[p]reliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by the court, subject to the provisions of subdivision (b)." Fed. R. Evid. 104(a) (West 1997). "Subdivision (b)" states that "[w]hen the relevancy of evidence depends upon the fulfillment of a condition of fact, the court shall admit it upon, or subject to, the introduction of evidence *sufficient to support* a finding of the fulfillment of the condition." Fed. R. Evid. 104(b) (West 1997) (emphasis added).

Daubert references *Bourjaily v. United States*, 483 U.S. 171 (1987), for the proposition that "[t]hese matters should be established by a preponderance of proof." *Daubert*, 509 U.S. at 592 n.10. We do not, however, interpret "a preponderance of proof" to refer to a *burden* of proof, particularly as the Court in *Bourjaily* made the distinction between these two concepts, declaring that "the evidentiary standard is unrelated to the burden of proof on the substantive issues," and that "[t]he preponderance standard ensures that before admitting evidence, the court will have found it more likely than not that the technical issues and policy concerns addressed by the Federal Rules of Evidence *have been afforded due consideration.*" *Bourjaily*, 483 U.S. at 175 (emphasis added).

[10] 293 F. 1013, 1014 (1923).

[11] *Daubert*, 509 U.S. at 588 (citing *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 169 (1988)).

dence, and emphasized that the inquiry demanded by those rules is "a flexible one," one which focuses "solely on principles and methodology, not on the conclusions that they generate." [12] Thus, in addition to prescribing fluid and general standards for the admission of scientific testimony, *Daubert* also described the trial court's role as that of a "gatekeeper" who should exercise broad discretion in admitting scientific testimony that could later be tested by "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof . . . ." [13] As the Third Circuit has stated, plaintiffs do not "have to prove their case twice—they do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are *correct*, they only have to demonstrate by a preponderance of evidence that their opinions are reliable." [14]

Neither party disputes that, at the beginning of the *Daubert* hearing, the district court told Jim Rothschild, counsel for Therm-O-Disc, "[y]ou have the burden of proof" with regard to Rodems's testimony.[15] However, counsel immediately corrected the district court on this point,[16] and from then forward it appears that the district court understood both the demands of *Daubert* and its own role as "gatekeeper," [17] and conducted the hearing accordingly. Immediately after the objection, the district court withdrew its call for Mr. Rothschild to come forward and show that Rodems's testimony was not admissible, and called Rodems himself to the stand o explain the basis for that testimony. This Rodems did under both direct and cross-examination. After several hours of testi-

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12 *Id.* at 594-95.

13 *Id.* at 596.

14 *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 (3d Cir. 1994) (emphasis in original).

15 J.A. at 4.

16 *Id.*

17 *See, e.g., id.* at 100; 102.

mony, the district court determined that, although it had some reservations about the proffered basis for Rodems's opinion, "the defendant has failed to establish . . . [that] Mr. Rodems relied upon a scientific principle that was not valid." [18]

Therefore, we are satisfied that an examination of the record shows that no improper burden-shifting took place. Clearly, the court called upon Maryland Casualty to meet its burden of production by coming forward with evidence to support its contention that Rodems's testimony would be both reliable and helpful. When this was presented, Therm-O-Disc was given the opportunity to rebut, but was unsuccessful in persuading the court that Rodems's testimony was not as reliable or helpful as Maryland Casualty claimed.

From a review of the record, we conclude that the general process contemplated by *Daubert* took place in the hearing, and that Maryland Casualty squarely bore the burden of production. Therefore, we decline to reverse the district court's decision on this ground.

B.

Therm-O-Disc also claims that the district court failed, in contravention of *Daubert*, to take into consideration certain factors in making its decision to admit Rodem's testimony. Specifically, Therm-O-Disc argues that there is no evidence in the record that the district court considered any of the "four non-exclusive 'general observations' that *are to be* evaluated by the trial judge" [19] pursuant to a *Daubert* inquiry.[20] But here again, we find that Therm-O-Disc has misread *Daubert*, and decline to disturb the district court's decision on this ground.

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[18] *Id.* at 184.

[19] Appellant's Br. at 24 (emphasis added).

[20] *See Daubert*, 509 U.S. at 593-95.

In *Daubert*, the Court established two factors that "the trial judge must determine" [21] before scientific expert testimony can be admitted. Those factors are, as stated above, (1) whether the testimony is based on "scientific knowledge" (i.e. knowledge grounded "in the methods and procedures of science"),[22] and (2) whether the testimony will be helpful to the trier of fact. The *Daubert* court described this mandated inquiry as "a preliminary assesment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." [23]

However, beyond this inquiry, the *Daubert* court expressly declined to require consideration of any other specific factors, stating that "[m]any factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test." [24] The *Daubert* court did make what it termed "general observations" [25] regarding what a judge should keep in mind in determining the admissibility of expert scientific testimony, but it is clear that these "observations" do not constitute the mandatory criteria described by Therm-O-Disc.[26]

Daubert clearly contemplates the vesting of significant discretion in the district court with regard to the decision to admit expert scientific testimony. Beyond establishing the two criteria of reliability and helpfulness, the Court has left the means by which these criteria are evaluated

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21 *Id.* at 592.

22 *Id.* at 590. As stated above, "scientific" is often considered synonymous with "reliable." *See, e.g.*, Kenneth R. Foster & Peter W. Huber, *Judging Science: Scientific Knowledge and the Federal Courts* 15 (The MIT Press 1997).

23 *Daubert*, 509 U.S. at 592-93.

24 *Id.* at 593.

25 *Id.*

26 *See* Appellant's Br. at 24; *see also Daubert*, 509 U.S. at 598 (Rehnquist, C.J., concurring in part and dissenting in part).

to the sound discretion of the district judge. This is apparent not only from *Daubert* itself,[27] but from subsequent Supreme Court precedent, holding that abuse of discretion is the proper standard by which evaluations of proferred evidence should be reviewed.[28] In addition, this circuit has taken the position that the *Daubert* court "was not formulating a rigid test or checklist," and was "relying instead on the ability of federal judges to properly determine admissibility." [29]

Thus, we reject Therm-O-Disc's contention that, beyond reliability and helpfulness, there are further considerations a district court *must* make in order to comply with the

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[27] *See Daubert*, 509 U.S. at 593 ("We are confident that federal judges possess the capacity to undertake this review.").

[28] *Joiner*, 118 S. Ct. at 517.

[29] *Benedi v. McNeil-P.P.C., Inc.*, 66 F.3d 1378, 1384 (4th Cir. 1995) (citations omitted). *See also United States v. Bynum*, 3 F.3d 769, 773 (4th Cir. 1993) ("The [*Daubert*] Court emphasized that it was prescribing a 'flexible' rule, one committed, as are most questions of admissibility of evidence, to the discretion of the district courts."). Therm-O-Disc relies on *United States v. Powers*, 59 F.3d 1460 (4th Cir. 1995), for the proposition that, in this circuit's reading of *Daubert*, there are four factors "the Supreme Court directed trial courts to consider when evaluating the scientific validity of proposed evidence:

> (1) Whether the theory or technique used by the expert can be, and has been, tested;
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> (2) Whether the theory or technique has been subjected to peer review and publication;
>
> (3) The known or potential rate of error of the method used; and
>
> (4) The degree of the method's or conclusion's acceptance within the relevant scientific community."

Powers, 59 F.3d at 1471 (citing *United States v. Dorsey*, 45 F.3d 809, 813 (4th Cir. 1995)).

While we agree that this language in *Powers* would appear to make consideration of the four factors mandatory, we recognize that *Dorsey*, which *Powers* quotes for these factors, expressly states that "trial courts *may* consider several factors," and lists them accordingly. *Dorsey*, 45 F.3d at 813 (emphasis added).

demands of *Daubert*. Further, in the present case, we are satisfied that the district court did not abuse its discretion in admitting Rodems's testimony.

As Maryland Casualty notes in its brief, Rodems is an electrical engineer with over twenty-five years experience in analyzing switch failures. Through his testimony, Rodems established that his opinion was based on his examination of the conditions inside the disputed switch and the application of principles of electrical engineering to those conditions.[30] Rodems was able to cite numerous works of technical literature that he alleged supported his mode of analysis,[31] and testified that his opinion regarding electrical failures has been admitted by at least one other district court.[32]

Based on this evidence, we hold that the trial court did not abuse its discretion in admitting Rodems's testimony. Maryland Casualty came forward with ample evidence from which the district court could have made its "preliminary assessment" of reliability and helpfulness, and the district court clearly did not find that Therm-O-Disc's rebuttal was sufficient to overcome that evidence. As the matter was within the district court's sound discretion, we find that it committed no error in deciding to admit the testimony.

II.

We next consider Therm-O-Disc's contention that Maryland Casualty did not prove a causal link between the thermostat and the fire in the Gitelson home, and thus that Therm-O-Disc was entitled to judgment as a matter of law. Under Maryland law, which applies in this diversity case, to recover in strict liability for a manufacturing defect, a plaintiff must establish, *inter alia*, a causal rela-

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[30] J.A. at 10; 16; 23-24; 140.

[31] *Id.* at 16-18.

[33] *See id.* at 294-306.

tionship between the claimed defect and the injury.[33] There is no question that the offered proof must rise above the level of speculation or conjecture.[34] Any facts that establish proof greater than speculation or conjecture, however, create a question for the jury.[35] Furthermore, proximate cause may be established by circumstantial evidence.[36]

In this case, the jury heard Rodems's theory that the thermostat was defective and caused the fire. Maryland Casualty introduced other evidence that ruled out any other cause of the fire. Under these circumstances, it was left to the jury to determine the question of causation, which it resolved in favor of Maryland Casualty. Examining the evidence in the light most favorable to Maryland Casualty, we hold that the jury properly reached its verdict.

III.

Finally, Therm-O-Disc disputes the district court's admission of Mrs. Gitelson's testimony concerning her damages. It argues that expert testimony was required to establish the value of Mrs. Gitelson's household goods.

Mrs. Gitelson testified as to the value of her household possessions, including the following: a $3,500 blouse, two $2,000 dresses, several dresses worth $1,000 or more, sixty sweaters and pairs of shoes valued at over $200 each, two sofas worth a total of $25,000, a shower curtain valued at almost $1,900, and other similarly expensive items. In *Lakewood Engineering & Manufacturing Company v. Quinn*,[37] the Maryland Court of Appeals took

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[33] *Jensen v. American Motors Corp.*, 437 A.2d 242, 247 (Md. App. 1981).

[34] *Id.* at 245.

[35] *C & K Lord, Inc. v. Carter*, 536 A.2d 699, 709 (Md. App. 1988).

[36] *McSlarrow v. Walker*, 467 A.2d 196, 200 (Md. App. 1983).

[37] 604 A.2d 535 (Md. App. 1992).

note "of the long-standing rule that an owner of property can testify as to its value."[38] Under Maryland law, a homeowner can testify as to the fair market value of common consumer goods, which will usually be close or equal to their replacement cost. Expert testimony, however, is required to establish the value of unusual items such as rare books or art work.[39]

Therm-O-Disc argues that the items Mrs. Gitelson lost in the fire were so unusual as to require expert testimony. Therm-O-Disc's position confuses the nature of the goods with the quality of the goods. While the goods in question were clearly expensive, they were indisputably common, household goods. Thus, we hold that, under *Lakewood*, no expert was required, and that Mrs. Gitelson's testimony was sufficient to establish her damages.

IV.

For the foregoing reasons, the judgment of the district court is affirmed.

AFFIRMED

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[38] *Lakewood Eng'g. & Mfg. Co. v. Quinn*, 604 A.2d 535, 542 (Md. App. 1992).

[39] *Id.* at 542-43.

UNITED STATES DISTRICT COURT
DISTRICT OF MARYLAND

January 29, 1996

MEMO TO COUNSEL RE:
Maryland Casualty Co., et al.
v. Therm-O-Disc, Inc., et al.
Civil No. JFM-93-1132

Dear Counsel:

I have reviewed defendant's motion for judgment after trial and its motion to reduce judgment.

Defendant's motion for judgment after trial is denied. The motion does not raise any issue that I did not carefully consider prior to and during the trial. Although as a fact finder I very likely would have reached a different conclusion than did the jury, I am persuaded that plaintiffs presented sufficient evidence of a defect, that the lapse of time between the date of manufacture and the fire did not disprove a defect and that Mr. Rodems' testimony met the *Daubert* test.

Defendant's motion to reduce judgment is, however, granted. Both under the terms of the release between plaintiffs and Whirlpool Corporation and under Maryland law the judgment against defendant must be reduced by 50%. *See* Maryland Code, Art. 50, § 20; *Jones v. Hurst*, 54 Md. App. 607 (1983); *St. Louis v. Beckles*, 81 Md. App. 41 (1989). Indeed, the law on the point appears to be so clear that I am disappointed that plaintiffs have opposed the motion.

Despite the informal nature of this ruling, it shall constitute an Order of Court, and the Clerk is directed to docket it accordingly.

Very truly yours,

/s/ J. Frederick Motz
J. FREDERICK MOTZ
United States District Judge

cc: Court File

APPENDIX B

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

Civil No. JFM-93-1132

MARYLAND CASUALTY COMPANY, *et al.*

v.

THERM-O-DISC, INC. *et al.*

ORDER

For the reasons stated in the memorandum to counsel being entered herewith, it is, this 29th day of January, 1996,

ORDERED:

1. Defendant's motion for judgment after trial is denied;

2. Defendant's motion to reduced judgment is granted; and

3. The judgment entered in favor of plaintiffs against defendant Therm-O-Disc, Inc. is reduced to $317,946.50.

/s/ J. Frederick Motz
J. FREDERICK MOTZ
United States District Judge

APPENDIX C

Filed March 24, 1998

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

No. 96-1192
CA-93-1132-JFM

THE MARYLAND CASUALTY COMPANY,
as Subrogee of Eileen K. Gitelson;
EILEEN K. GITELSON;
SELMA INVESTMENT CORPORATION,
Plaintiffs-Appellees

v.

THERM-O-DISC, INCORPORATED,
Defendant-Appellant

and

WHIRLPOOL CORPORATION;
EMERSON ELECTRIC COMPANY,
Defendants

ON PETITION FOR REHEARING WITH
SUGGESTION FOR REHEARING IN BANC

The appellant's petition for rehearing and suggestion for rehearing in banc were submitted to this Court. As no member of this Court or the panel requested a poll on the suggestion for rehearing in banc, and

The panel considered the petition for rehearing and is of the opinion that it should be denied. The denial of rehearing is entered by a quorum of the panel pursuant to

28 U.S.C. 46(d). Judge Russell died prior to disposition of the petition for rehearing.

IT IS ORDERED that the petition for rehearing and suggestion for rehearing in banc are denied.

For the Court,

/s/ Patricia S. Connor
Clerk

APPENDIX D

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

Civil Case No. JFM-93-1132

MARYLAND CASUALTY COMPANY,
As Subrogee of AKA
EILEEN K. GITELSON, *et al.*,
Plaintiffs

VS.

THERM-O-DISC, INCORPORATED,
Defendant

Baltimore, Maryland
November 27, 1995

The above-entitled case came on for trial before the Honorable J. Frederick Motz, Chief Judge.

* * * *

[2] PROCEEDINGS

THE CLERK: Before the Court is Civil Case Number JFM-93-1132, Maryland Casualty Company, et al. versus Emerson Electric Company, et al. This matter is now before the Court for a hearing before jury selection.

Counsel, please identify yourselves for the record.

MR. OPALISKY: Mark Opalisky for the plaintiffs.

MR. ROTHSCHILD: Jim Rothschild for the defendant, THERM-O-DISC.

MR. AIST: And James Aist also for THERM-O-DISC, Your Honor.

THE COURT: As soon as the jury is ready, we will pick the jury and then suspend this hearing and decide what to do at that point, but let's get started.

We are here on essentially a Motion In Limine filed by the defendant in regard to the admissibility of the proffered expert testimony, Mr. Rodems. We are going to have a Daubert, D A U B E R T, type hearing at this point.

I understand the plaintiffs object to holding such a hearing on the grounds that plaintiffs' counsel may have to cross-examine Mr. Mason in areas that he would prefer to wait unitl trial to do. That, unfortunately, is the nature of Daubert, but sometimes [3] things have to be done in advance of trial.

I do not accept the proposition that Daubert simply doesn't apply here. I do think I have to make some kind of determination, so, therefore, I am going to have to hear some testimony. To the extent to which plaintiffs' counsel chooses to cross-examine Mr. Mason, it is entirely up to him.

Let me say also that recognizing I have a gatekeeping role, I am going to do the very best that I can to make a determination based upon what I hear today.

* * * *

[4] Let's get started. I've read the papers. Mr. Rothschild, I understand you want to go forward. You have the burden of proof.

MR. OPALISKY: Your Honor, might I just make one note for the record? That is that under Daubert, the gatekeeping role, as I understand it, is to make sure that Mr. Rodems' opinion is based on reliable criteria. I think it is fundamentally unfair if their expert goes first to say what he thinks Mr. Rodems' opinions is versus Mr. Rodems to explain to the Court his opinion, the basis for it.

THE COURT: Do you want to go first with that?

MR. OPALISKY: I think that might be fair, Your Honor.

MR. ROTHSCHILD: Your Honor, my only concern is I think we are dealing with the opinion that he gave in his reports and the opinion he gave in his deposition.

THE COURT: That is dramatically different. He [5] is complaining that your expert people are giving new opinions. That is a whole different issue. If he is going to give a different opinion, then you want to know that now anyway because you are going to move to strike it on the ground that it is different to begin with, so why don't we go ahead with Mr. Rodems then.

MR. ROTHSCHILD: Whatever the Court prefers.

THE COURT: Go ahead. Mr. Rodems, please come forward.

THE CLERK: Please raise your right hand.

JAMES D. RODEMS

a witness called on behalf of the plaintiffs, having been previously duly sworn, was examined and testified as follows:

* * * *

THE CLERK: Please state your name for the record and spell your last name.

THE WITNESS: James D. Rodems, R O D E M S.

* * * *

[7] Q Have you examined thermostats in the past during your career?

A Yes, sir, many.

Q Approximately how many times?

A At least 20 or 30 times.

Q The principles regarding thermostats and the heat generated, have you focused on those principles in other examinations?

A I have.

* * * *

[16] Q Sir, are there any noted or authoritative references that you have an understanding that talks about the various sources of heat and the heat increasing?

A Yes, sir.

Q Would you explain to the Court what those sources are?

A I have some references here, Handbook of Insulating Materials that talks about the normal operation of phenolics and materials of that sense or [17] that kind.

Then we have the Materials Handbook, which talks about contact materials and arc erosion and phenolics and the temperature, operating temperature ranges.

I have a third reference, Encyclopedia of Physics which addresses arcs and sparks and the plasma ionized gas density related thereto.

I have another reference called Applying Precision Switches by Lockwood, which also talks to plasma and arcs.

I have another reference called Understanding Electric Arcs, which talks about ionized air and insulation surface tracking, about flashover and the melting of droplets of the conducting material causing insulation heat damage in the region of two to 3,000 degrees Fahrenheit.

I have another reference, again Lockwood, which talks about switch destruction and insulation resistance loss, and the same Lockwood reference, which is an 1884 document, talks to insulation breakdown in these switches.

* * * *

[24] CROSS-EXAMINATION

BY MR. ROTHSCHILD:

* * * *

]25[Q Isn't it a fact, sir, that you were aware of no literature that talks about an arc creating, self-destructing a thermostat, creating self-destruction in a thermostat that has those elecrtcial characteristics?

A That I was what, sir?

Q There is no literature or any studies showing that internal heating or arc damage can cause a thermostat with those characteristics to self-destruct; isn't that correct?

A No, there is literature that discusses that.

Q Isn't it a fact that when you were at your deposition you agreed there was no specific literature on the issue of a thermostat, with the type of thermostat we are talking about here, can self-destruct because of internal heating or arc damage? We talked about this thermostat as opposed to arc damage in some other application?

A Are we restricting this to this particular?

Q Yes, we are.

A Well, I have a reference in there now that speaks to thermostat failures which are due to overheating of various parts of the thermostat.

Q That wasn't my question. My question is, isn't it a fact that there is no literature in the field or [26] any studies about showing that internal heating or arc damage can self-destruct a thermostat? Isn't that correct?

A I think you are putting words in my mouth, sir. Mr. Mason's book itself addresses the effects of—

Q I am talking about in this application, in the application of a thermostat, not arcing in general in other types of electrical components, I am saying in this thermostat, the Gitelson thermostat, this 21 amp, 240 volts, isn't it a fact there is no literature and no report from any studies showing that that type of thermostat with those characteristics has ever self-destructed because of internal heat or arcing; isn't that correct?

A That is not correct.

Q Okay. Would you give me a reference to one study?

A Mr. Mason himself, in paraphrasing, or I should say using Mr. Lockwood's '84 report, specifically talks about how the switch can be destroyed.

Q Does he talk about that it can be destroyed from —did he talk about any destruction of a swich from internal heating that causes it to self-destruct, that it reaches such temperatures that it causes it to self-destruct?

[27] A It talks about arcing.

Q I know he talks about arcing in general. I am asking about this application, not general principles of arcing. I am asking whether there is any literature that supports

your theory that in this application, in a switch of this size, with this characteristics, that it has ever been noted that one has self-destructed because of excessive internal heat or because of excessive arcing?

A Sir, it is common knowledge that millions of these switches are used, and they fail.

Q I am asking you if you can show me a report anyplace, from anyone which has documented that one of these switches has failed in the manner, this type of switch has failed in the manner that you say it has failed in this case?

In fact, do you recall testifying at your deposition that there were no such studies?

A Well, at this point, sir—

Q Question, page 381, have you ever seen it described in any literature involving the safety overtemperature thermostat?

Answer, I don't think so, but I don't recall.

Do you recall giving that testimony?

A Yes, sir.

[28] Q Isn't it a fact that you have never seen described in any literature that a safety overtemp thermostat with this thermostat's characteristics has ever failed because of excessive arcing or excessive internal heat damage, heat?

A Sir, I would specifically refer you to your own client's test, in which you specifically—

Q I am asking you—

* * * *

THE WITNESS: Only in a general sense of problems of that nature with all switches.

BY MR. ROTHSCHILD:

Q Have you, yourself, conducted any tests in which you have been able to have a thermostat, this type of thermostat, a 60T, with these elecrical characteristics, in which you had it run and that it is self-destructive because

of either internal heating or because of arc damage? Have you conducted any such tests?

A On this specific thermostat, no. Others, yes.

[29] Q Do you have the ability to conduct such tests?

A I do.

Q In this case, you did not conduct any testing to confirm your two theories that there was either excessive internal heating or there was excessive arc; is that correct?

A I leaned on the exemplar and on the unit that is part of this.

Q I'm asking you whether you conducted any tests. I wish you would answer my question.

You had the ability to conduct such tests. Did you conduct any such tests to see whether your opinions were borne out by testing?

A I did not conduct a life cycle test on this unit.

Q Isn't it a fact that the only time you have ever seen any type of arc damage was in switches that were in much better, bigger electrical, had much greater electrical current going through them, such as circuit breakers, relays and power panels?

A That is wrong sir.

Q Do you recall testifying in your deposition, where I asked you, have you ever seen any literature or periodicals, anyone else expressed a similar opinion with regard to destruction of a thermostat, that it was [30] due to an arc of a plasma arc?

Answer, it sustained its plasma arc? I've seen it in other switches. I don't ever recall seeing it in one of these.

What kind of switches have you seen it in?

Answer, circuit breakers, relays and power panels.

Do you recall giving that testimony that the only time you have seen it or seen it in the literature was in bigger applications, such as circuit breakers, relays and power panels?

A Sir, 21 amps is not considered a small application.

Q I'm asking you whether you gave that answer, that the only time you had seen it before was in circuit breakers, relays and power panels?

A I gave you that answer, but that doesn't restrict it to this unit.

Q Isn't it a fact that you testified you had never seen it happen in this unit?

A Only insofar as the exemplar.

Q Well, the exemplar you are talking about is something from another case; isn't that correct?

A You asked me whether I have seen it or not.

Q Have you ever seen a thermostat that looks like [31] the Gitelson thermostat, anybody ever report that a thermostat that had the characteristics of the Gitelson thermostat self-destructed from internal heating or from excessive plasma arc?

A Yes, sir, and I gave you that answer in my deposition.

Q Where—in your deposition you said that you hadn't seen anything in a safety overtemperature thermostat; isn't that correct?

A That is not correct, sir.

Q Where, would you give me one example of where anybody has reported this type of thermostat with these types of characteristics has ever destructed, self-destructed from either excessive internal heating or from a plasma arc internal to the switch case?

A You will also look in my deposition and see that I cited a case in which we were unable to get the documents from. That was the Fairbanks Farm case in which a similar thermostat was blamed.

Q My question is are there any reports in any periodical, recognized periodicals in the field about this, yes or no?

MR. OPALISKY: About what?

Q Showing self-destruction of a thermostat as you postulated.

[32] THE COURT: Overruled.

A My references do indicate and imply that effect.

Q Do the specifically discuss it in this application, your records?

A They discuss the generic effects of arcing, contact heating, spattering of metal against, the molten metal against the inside of a switch and the pyrolyzation and arc tracking inside a switch, all of which generate heat and all which lead to a destruction.

Q They discuss general principles, but none of your references discuss that anything like that has occurred in an application such as this; isn't that correct?

A I can't answer that question, sir, because I can draw from general principles, and all of the exact cases I have looked at in the literature, and it is relatively easy to draw the conclusion of what caused this problem in those references.

Q I am asking you whether the references, the references that you relied on discussed whether those general principles can create—in fact, isn't it a fact that those references you rely on do not discuss that the general idea of the arcing or whatever could lead to destruction in a thermostat of this characteristic? Isn't that correct?

[33] A No, that is incorrect. The references clearly point us in the direction of what are the sources of heat inside that unit.

Q Do they report that, do they report that what happened, specifically, are there any reports of what happened in this application? Is there anything, any report of where it has happened, anybody who had done any testing, anything in which this application, that is what we are talking about, the Gitelson 60T thermostat with these characteristics, any of the millions and millions and millions that have ever been made with similar switches of the same characteristics have ever self-destructed because of internal heating or an internal arc plasma.

MR. OPALISKY: Judge, may I object on two grounds? One, I think it has been answered several times. Two, under Daubert, the test is not for him to point out someplace where the conclusion is there, but the principles in reaching that conclusion.

THE COURT: I think that that is right. It would be a lot easier, when you answer the question, if the answer is a simple know, just say no. The relevancy of it is another point.

THE WITNESS: If I understand what the question is—

[34] THE COURT: The answer is obviously no. He is talking about the Gitelson, he is talking about the Gitelson thermostat.

THE WITNESS: I will go along with that, sir.

BY MR. ROTHSCHILD:

Q In fact, isn't it a fact that in your own experience you have never seen a switch that self-destructed in the manner that you postulate the Gitelson's switch self-destructed?

A That is wrong. I refer you back to the Fairbanks case. They have the exact, very similar set of circumstances.

Q But you don't have any information on that to provide us, you weren't able to provide any—

A It is under some kind of settlement agreement which restricts the distribution of the knowledge that I don't have any control over.

Q Now, in fact, isn't this the first case that you ever indicated, related the destruction of internal parts of a thermostat to a plasma arc?

A I didn't say that.

Q Didn't I ask you in your deposition? Is this the first time you've ever given such a theory of how a moveable arm was being destroyed in a safety overtemp thermostat, and your answer is, that's correct?

[35] A The only exception to that, sir, is in the Fairbanks case.

Q When you were deposed and you were under oath, you didn't give any exception. You said this is the only example of where you've ever seen an arc that destroyed the internal parts of a thermostat. I will read the answer, question and answer to you again.

Didn't you testify to that under oath at your deposition?

A Would you kindly read the question again, please?

Q Yes. The question is, is this the first time you've ever given such a theory of how a moveable arm was being destroyed in a safety overtemp thermostat?

Answer, that's correct.

A I agree with that.

MR. ROTHSCHILD: I have no others questions for Mr. Rodems.

THE COURT: Anything further?

* * * *

[37] RECROSS EXAMINATION

BY MR. ROTHSCHILD:

* * * *

[39] Can you tell me, Mr. Rodems, do you know anything about the fire in that case?

A Sir, I have no idea, just never could relate this to a case number in my laboratory.

Q So you don't know whether the fire in that case was outside the dryer or inside the dryer?

A I have no idea, sir.

Q You don't know how the thermostat was removed from the dryer; is that correct?

A I do that. Two screws were taken out.

Q You didn't remove it, did you?

A No.

Q You don't know what, if any—

THE COURT: He knows nothing, except that he found it on the shelf, an exemplar.

THE WITNESS: Precisely.

THE COURT: The lines that it has and the pattern, wear pattern that it has, right?

THE WITNESS: Yes, sir. That is the sum and substance.

BY MR. ROTHSCHILD:

Q Do you know how long that thermostat had been in use prior to, when it manufactured?

A No, sir.

* * * *

[41] [WELLS]

DIRECT EXAMINATION

BY MR. ROTHSCHILD:

* * * *

[43] Mr. Wells, how many of these 60T thermostats were made in 1983 by THERM-O-DISC?

A In 1983, this particular part number, there were around one and a half million made, one a third to one and a half. Total number of controls made of this type of family were around 15 million in 1983.

Q How many had been made of this type, the 60T, since 1993?

[44] A This particular part number ran about ten million over the past 10, 15 years.

Q Have you, had Therm-O-Disc gotten any reports over the last ten years of any thermostats self-destructing because of internal arcing or internal heating?

A No.

Q Has THERM-O-DISC gotten any reports that there had been any problems with internal heating or arcing because contacts were misaligned?

A No.

* * * *

[46] Q Did you, after that, undertake to do any tests to determine whether or not, even if those conditions existed, you would have, they would be a mechanism for the thermostat to self-destruct?

A Yes. We did some tests to demonstrate what would happen.

Q Would you tell the Court what tests you did?

A We built some controls and took some effort to make sure that the contacts did misalign. We built three sets of controls, some with contacts properly aligned, some of them with the contacts overhung, as he suggested might have happened, and some of them with [47] the contacts toed severely, as he suggested might have happened.

Then we took those controls and we put them on a life test stand, where we simply operate the control on and off, on and off, and did two series of those tests.

One we did with the control operating at a 21 amp, 240 volt load, electrical load, as would be found in the clothes dryer. Then we did another series of tests where we had the controls operate at 66 amp, 240 volt load. That would be three times as heavy a current and substantially more heating generated at the contacts because of just the electrical load.

* * * *

THE COURT: I don't need that for this purpose. For this purpose I know what he did.

You ran tests which contradicted his theory?

THE WITNESS: Yes.

* * * *

BY MR. ROTHSCHILD:

[48] Q Now, are you familiar with the literature in the field with regard to switches?

A Yes.

Q How long have you been involved with THERM-O-DISC and the manufacture of switch and design of switches such as the 60T?

A I have been working with THERM-O-DISC now for 12 or 13 years. As far as my career as a whole, it has been 23, 24 years working with controls and equipment that uses controls.

Q Are you aware of any literature in the field which indicates that a thermostat with an electrical load of 240 volts, operating at 21 amps, has self-destructed or could

self-destruct because of internal electrical heating from various sources or because of a buildup of arc heating?

A No, I am not aware of any literature that refers to that phenomenon.

Q Are you aware of any testing that has shown that that can occur?

A No, I am not.

* * * *

[56] JOHN R. MASON

a witness called on behalf of the defendant, having been previously duly sworn, was examined and testified as follows:

THE CLERK: Please be seated. Please state your name for the record and spell your last name.

THE WITNESS: Yes. My name is John R. Mason, M A S O N.

DIRECT EXAMINATION

BY MR. ROTHSCHILD:

* * * *

[58] Q Would you explain to the Court why, going through the various things that Mr. Rodems said about heat buildup, resistance heating, arc heating, why you don't agree with that in this application?

A Certainly. Resistance heating, arc heating, the general principle is correct, but in this particular switch, this type of switch, it is not a valid theory. You can have arc damage in very large complex switches. In fact, Mr. Rodems mentioned circuit breakers, switch gear, power switches, very large, complex, high current, high amperage devices. There is certainly evidence of arc damage, as Mr. Rodems has indeed testified he has seen before, arc damage in these types of switches.

The arc in just a small switch, a small single-pole, single-throw switch is so microscopic, so minuscule that

it would not cause the damage that we are talking about in this particular device.

* * * *

[62] Q Now what about the characteristics—you can resume the stand.

Mr. Rodems referenced to you as a source as to the various types of heating that can occur. Resistance heating he talked about and the heating from arcing, and just the ambient air heating.

Do you have an opinion as to whether those basic principles, taking those basic principles from your book, one could opine, to a scientific basis, that in this application that type of heating could get hot [63] enough to actually do damage to the internal structure of the thermostat and cause it to self-destruct, given the characteristics of this thermostat?

A No, there is no scientific evidence that that holds at all.

Q Would you explain to the Judge why? What about this application that would not make it, would not allow the general principles of arcing that may apply in other applications apply here?

A Again, it is a factor of size. The general principle holds, as I mentioned before, contact resistance, switch resistance are present in all switches. This particular switch, 21 amps, 240 volts is striking a very, very small arc.

Let me illustrate it this way. In large power switches, like circuit breakers, switch gears, that sort of thing, switch designers deliberately build in devices to extinguish the arc. They call it arc shoots, arc runners. These devices are built into the power switches because it is going to strike a large arc.

If you look at the cross-section or the actual switch itself in this device, there is no such devices in there to extinguish the arc. The switch is designed to extinguish the small arc across that gap. There is [64] no additional design necessary.

THE COURT: What did you say? What is done, what is done in a smaller switch?

A Nothing. There is no design extension to extinguish the arc in these devices such as opposed to a power switch. There is no additional device in here to extinguish the arc.

Q Why is that?

A Because the arc is very small. The gap, once it is open, the gap between the switch contact is very small, so we are not going to have a runaway arc or moving arc of any kind in this type of device. You do in the power switches.

Q What are you talking about in terms of current load in power switches?

A Oh, power switches, these are very large power switches, you could be switching 500,000 amps, 2,000 amps for power distribution systems primarily, very large, heavy-duty, very complex switches.

Q Now did you see in Mr. Rodems' deposition that he postulated a theory in which I think he said there was a catastrophic plasma arc that occurred in this switch?

A Plasma arc, yes.

Q Do arcs occur—I think you testified that arcs do occur in switches; is that correct?

[65] A An arc must occur in a switch in order for the switch to be disabled or disconnected.

Q Have you ever heard of the concept of a catastrophic plasma arc in a switch such as this?

A No, I have not.

Q Is there any, in your opinion, based—there is reference that Mr. Rodems makes to your book, in which he talks about arc and arc damage. Then it says therefore, it occurs there.

Do you agree that general discussions or what arcs can do in general support an opinion that there was a catastrophic plasma arc, and this could occur in this switch?

A No.

Q Why not?

A Well, number one, there is no scientific support for the catastrophic arc theory.

Number two, the size of the arc in this particular switch, as it is being opened, it doesn't lend itself to any runaway catastrophic or cascading catastrophe involving the arc. We are talking a matter of comparison of size, I believe, is what it comes down to.

Q Now, when did you publish this Switch Handbook?

A December, 1993.

[66] Q In doing the research for that, did you ever come across any studies, reports information from any source that, one, indicated that there could be internal heating up to 1400 to 1700 degrees in a switch of this type?

A Other than very localized, microiscopic heating, no.

Q That there could be enough heating in a switch of this type that could cause its internal destruction?

A No.

Q Did you ever come across, in doing the work for this book and references, any reports or any literature indicating that a switch of this type or this characteristic, a catastrophic plasma arc could occur that could explode and blow the switch apart?

A No.

Q Had you ever even heard, before reading Mr. Rodems' deposition, had you ever even heard of either of these two theories postulated by anyone?

A No, I have not.

Q Are you aware of any testing that has been done by anyone, including THERM-O-DISC, which supports or contradicts Mr. Rodems' theory?

What, if any, value do you place in the Therm-O-Disc life cycle test they did with misaligned [67] contacts?

A Well, the testing itself seemed to be done under proper controls, very eloquent testing. I think the test results indicate that there is no, even with severely misaligned, deliberately and severely misaligned switch con-

tacts, that the heating is not anything that would cause this catastrophe.

Q Now, how many switches would you say of this type, basic switches—you said it was the same type of switch that occurs in light switches—how many would you say are currently in use?

A Oh, boy.

Q Just a basic figure.

THE COURT: Lots.

A Billions.

MR. OPALISKY: Billions, certainly.

Q Have you ever heard of a report of any one of those switches which is similar to how this operates, whether it is in a thermostat or in a light switch, any reports that any one of those had self-destructed because of a catastrophic plasma arc?

A. No. If the theory was correct, I think all of us in the room, maybe we would either have personal experience or know of exploding wall switches happening, so there is no validity to it.

[68] Even if you assumed, I just want you to assume, if you assume that with the billions of switches that are in operation, some of them, for some reason, may have been misaligned in some way, if Mr. Rodems' theory was correct, and that there are some out there, let's say hundreds or thousand of the billions were misaligned, what would have happened if his theory was correct on what happens when there is a misalignment?

A If the theory was correct, you would turn the wall switch on in your house and there would be some sort of a catastrophic explosion of the switch itself.

Q Okay. Or with regard to his theory that it would cause tremendous buildup in temperature, 1400 to 1700 degrees, what would happen there?

A I suppose it might ignite. I might add that I have taken apart some, in the course of my working life, some standard wall switches. They are produced with a lot less design eloquence than this particular device here.

Q In your opinion, as—I think Mr. Rodems made reference also to some other sources in the field. I think one of them is someone on switches that you even use in your book. What is his name?

A Mr. Lockwood.

Q Lockwood, yes. Does he, in his publications, [69] report any incidences where an application of this size, you could either have destruction of a switch because of excessive internal heating or a catastrophic arc?

A No, no. He talks in generalities, in general principles that Mr. Rodems has discussed, but no specifics about this particular type of switch.

Q From a scientific basis, Mr. Mason, and dealing with, you know, how scientists reach conclusions in terms of methodology and analysis, can one take just a general principle and say it applies to all applications across the board?

A No, because there are always other variables involved in making those leaps of logic. It doesn't, it does not follow general principles. It is always specific to a paritcular case.

* * * *

[96] THE COURT: Do you want to put anything further on?

MR. OPALISKY: Not for purposes of defendant's motion, Your Honor.

THE COURT: Well, let me ask you. I mean in looking at Daubert, we don't have any test here that shows—and I don't care whether it is this exist thermostat. What I take it is a question of this switch, a switch, as I now understand you are supposed to say it, of this size; i.e., carrying or transmitting or whatever the word would be, this magnitude of current, there are no tests that you've produced and indeed, the only tests are those that Mr. Wells performed on this thermostat or more particularly, on the switch which showed that, under the theory of misalignment, the scenario as described by Mr. Rodems couldn't have happened. That is number one.

Number two, it is my understanding that the principles in the literature upon which Mr. Rodems is relying refer, it is a general principle, but there is [97] nothing in the literature that has been produced to me to show that it would apply to create heat essentially, arcing, and result in heat, in magnitudes anywhere near necessary to support Mr. Rodems' theory of the melting of the plastic, which has to be, I take it, up to, well, that has to be at 350 or 500. His theory is that it was up to 1400 to 1700; is that correct?

MR. OPALISKY: No, Your Honor, the arc itself. The arc is that high.

THE COURT: Okay. The arc is that high.

MR. OPALISKY: The arc is 1700 degrees. You are talking a minimal distance. That phenolic has to sense temperatures up around 400 degrees for it to shrink.

THE COURT: The question is where is there before me anything, either by a specific test or by anything in the literature, to support Mr. Rodems' opinion that that could have happened?

MR. OPALISKY: Well, Your Honor, I need to first, I guess, start back into it. For one, that is what Daubert deals with. It is showing a test because you are not able to analyze the product or to rely on other products you have analyzed. In this case, I submit even before the Daubert analysis applies of looking for tests or authoritative references, it has to be the type of forensic testimony, expert testimony that fits [98] into that category.

We get into the whole Frye test. There was a different test for scientific theories.

THE COURT: I don't want to hear the law. As I understand, there are various factors under Daubert. Two of them include test and testability, and here Mr. Rodems didn't conduct any tests to show that this could have happened the way he did it.

Now he didn't have to if there is, in literature, particularly peer review literature, a study showing the principle upon which he is relying is well-established.

What I have heard so far here is that yes, although there is a principle that this could happen, there is nothing in the literature to show that it happens when this magnitude of amperage is involved.

* * * *

[103] I have heard then testimony from Mr. Mason and from Mr. Wells that that principle does not apply, it does not apply to switches of the size, which I understand to mean, switches of the size means here magnitude of current that is involved in here, that it just doesn't happen, and that there is no support in the literature to support the proposition that it does happen.

So then one can argue, well, does there have to be support in the literature? I understand it is a fair question, but supporting the view expressed by the defendant, there are two things.

Number one, that Mr. Rodems himself had said on deposition that he had observed this to occur only in circuit breakers and other switches where the magnitude was greater and secondly, frankly, the common experience that if Mr. Rodems' proposition were true, one wonders why we don't have a lot more catastropic fires with switches, you know, where the current being transmitted is of 24 amps or is of a lesser magnitude.

That is where the record now is. On that record, frankly, I just think there is a missing gap then in Mr. Rodems' reasoning, which I am now invite the plaintiff to fill.

* * * *

[104] (Mr. Rodems resumed the witness stand.)

* * * *

[124]

CROSS-EXAMINATION

BY MR. ROTHSCHILD:

Q Mr. Rodems, you began your testimony by saying that you had seen many switches that had a catastrophic failure such as this one; is that correct?

A Circuit breakers, switches, thermostats, yes.

Q Isn't it a fact that at your deposition you testified just the opposite, that you had never seen a switch in a thermostat that had a catastrophic failure like this one?

A Quite the damage level, that is true.

Q Let me read you the question. In fact, you've never seen a catastrophic failure, arc failure in a thermostat like this before; isn't that true?

Answer, that's true.

Weren't you asked that question and didn't you give that answer while you were under oath on—

A Sir, that was—

Q Let me finish.

A Yes, sir.

Q On March 29, 1995. Pointblank, had you ever seen this type of catastrophic failure before in a thermostat? You said that you hadn't. Yes or no?

[125] A That is correct, sir, but you had me pinned in a corner. Let me answer.

Q No, no. I am asking you were you asked that question and did you give the answer.

THE COURT: You obviously asked the question and he gave that answer. Now you can explain. Go ahead.

A All during that deposition, sir, you kept insisting on a 60T11. Everything that I had done had to be was it a 60T11. I had never seen a 60T11 with that kind of damage, that's correct.

* * * *

[128] Q Right. Have you seen any articles or are you aware of any articles where anybody has done any tests to determine whether arc damage occurs at different current and amperage levels?

Are you aware of any articles that are published in which somebody has actually tested switches in [129] determining at what level is enough electricity for arc damage to occur and below what levels that arc damage does not occur?

A There are some studies that indicate that there are different degrees of damage, depending on how much current you have.

Q Do you reference any of those specific articles showing what the thresholds are for arc damage?

A You can draw an arc at—

Q No, I am asking you, do you have reference to any publications?

A I probably do. I don't have them with me.

* * * *

Q Do you have any references that you can tell us today of those articles which support your opinion that at 240 volts and 21 amperes, there would be arc damage, significant arc damage, unsafe arc damage when a thermostat of this type open and closes? Can you give me reference to any article that says that?

A I just referenced it.

Q No, I am talking about the specific amount of voltage in a thermostat.

A I can't recall that offhand, sir.

* * * *

[184] MR. ROTHSCHILD: Nothing else, Your Honor.

THE COURT: Mr. Opalisky, you don't have to cross-examine. I am persuaded by what I have heard this afternoon that we've descended into the area of opinion, that the defendant has failed to establish, short of your cross-examination, Mr. Rodems relied upon a scientific principle that was not valid. This is something we will describe for the jury. If I hear something else during the course of the trial that changes my mind, I will strike the testimony.

Now let's take up some of the other evidentiary issues while we are here. You can step down.

We have descended well into the area. If somebody lost respect—this isn't the first time in [185] the case the defendant thought they had a clear winner, and it didn't have it, I will say that.

Mr. Wells is here. I will say it. You thought you had a clear winner on Mrs. Gitelson's testimony and the housekeeper and everybody else. When you look at it in con-

text, things are never as black and white as everybody seems to think they are.

It could be that on the scientific principle you all will be able to persuade me that the same principle doesn't apply in the variables that exist, but you sure didn't establish it today, and I sure gave you enough time to do it.

(The Daubert proceeding concluded and other evidentiary matters were discussed.)